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ABSTRACT

An automatic drilling system regulates the drill string of a drilling rig in response to any one of, any combination of, or all of drilling fluid pressure, bit weight, drill string torque, and drill string RPM to achieve an optimal rate of bit penetration. The automatic drilling system includes a drilling fluid pressure sensor, a bit weight sensor, a drill string torque sensor, and a drill string RPM sensor which deliver a drilling fluid pressure signal, a bit weight signal, a drill string torque signal, and a drill string RPM signal to a drilling fluid pressure regulator, a bit weight regulator, a drill string torque regulator, and a drill string RPM regulator. The regulators control a drill string controller in response to the above signals so that it manipulates the drilling rig to release the drill string at a rate which maintains the maximum rate of bit penetration.